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### CLAIMS

What is claimed is:

1. (Currently Amended) A multilayer crosslinked polyethylene ("PEX") pipe comprising:

(a) an inner tubular core of high density polyethylene ("HDPE") having a maximum wall thickness from about 28 to 100 times smaller than the nominal diameter of pipe in the range from 7 mm (0.25") to 152 mm (6"), ratio 28 being attributable to small diameter non-SDR-9 piping, and ratio 100 being attributable to the larger diameter SDR-9 pipe, wherein the HDPE has a density in the range from 0.941 g/cc to 0.963 g/cc; and,

(b) an outer tubular sheath of at least one layer of ~~at least partially a~~ crosslinked polyethylene contiguous with the outer surface of the inner core layer, wherein said PEX is crosslinked to a gel level of at least 65% by a silane grafting process.

2. (Currently Amended) The multilayer pipe of claim 1 wherein the HDPE has a density in the range from about 0.950 to about 0.963 g/cm<sup>3</sup>, ~~and the PEX is crosslinked to a gel level of at least 65%.~~

3. (Original) The multilayer pipe of claim 2 wherein the inner core has a wall thickness in the range from at least 0.025 mm (1 mil) to about 1.52 mm (0.06") thick for pipe having a nominal diameter in the range from 7 mm (0.25") to 152 mm (6").

4. (Original) The multilayer pipe of claim 3 wherein the inner core has a wall thickness in the range from about 0.05 mm (2 mil) to 0.1 mm (4 mils) for pipe having a nominal diameter in the range from 13 mm (0.5") to 25 mm (1") and the gel level is greater than 70%.

Claims 5-6 (Cancelled).

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7. (Original) The multilayer pipe of claim 3 wherein the sheath includes successive inner and outer contiguous layers of PEX melt-bonded to one and another, the outer layer being color-coded.

8. (Original) A three layer PEX pipe comprising:

- (a) an inner tubular core layer of high density polyethylene (HDPE) having a maximum wall thickness from about 28 to 100 times smaller than the nominal diameter of pipe in the range from 7 mm (0.25") to 152 mm (6"), ratio 28 being attributable to small diameter non-SDR-9 piping, and ratio 100 being attributable to the larger diameter SDR-9 pipe, wherein the HDPE has a density in the range from 0.941 g/cc to 0.963 g/cc;
- (b) an intermediate tubular layer of crosslinked polyethylene (PEX) having a gel level of at least 65% contiguously disposed radially outward from the core layer; and,
- (c) an outer tubular layer of PEX having a gel level of at least 65%, wherein said outer tubular layer is color-coded for installation in a chosen service.

9. (Original) A multilayer pipe comprising:

- (a) an inner tubular core layer of high density polyethylene (HDPE) having a maximum wall thickness from about 28 to 100 times smaller than the nominal diameter of pipe in the range from 7 mm (0.25") to 152 mm (6"), ratio 28 being attributable to small diameter non-SDR-9 piping, and ratio 100 being attributable to the larger diameter SDR-9 pipe, wherein the HDPE has a density in the range from 0.941 g/cc to 0.963 g/cc;
- (b) an intermediate tubular layer of crosslinked polyethylene (PEX) having a gel level of at least 65%, contiguously disposed radially outward from the core layer;
- (c) an oxygen barrier of material other than polyethylene disposed radially outward from said intermediate layer.

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10. (Currently Amended) A process for producing a multilayer pipe comprising co-extruding:

- (a) an inner tubular core layer of high density polyethylene (HDPE) having a maximum wall thickness from about 28 to 100 times smaller than the nominal diameter of pipe in the range from 7 mm (0.25") to 152 mm (6"), ratio 28 being attributable to small diameter non-SDR-9 piping, and ratio 100 being attributable to the larger diameter SDR-9 pipe, wherein the HDPE has a density in the range from 0.941 g/cc to 0.963 g/cc;
- (b) an outer tubular core of at least one layer of crosslinkable polyethylene melt bonded to the outer surface of the inner core layer without the use of adhesive; and,
- (c) crosslinking by a silane grafting process at least the outer layer to have a gel content of at least 65%.